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FACTORS INFLUENCING STUDENTS' INTENTION TO ADOPT E-LEARNING WITH EXTENDED UTAUT

FAKTOR-FAKTOR YANG MEMPENGARUHI NIAT SISWA UNTUK MENGADOPSI E-LEARNING DENGAN UTAUT YANG DIPERLUAS

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ABSTRACT

This study aims to analyze the factors that influence students' intention to adopt e-learning in Surabaya, using a modified theoretical model of the Unified Theory of Acceptance and Use of Technology (UTAUT). Through a quantitative approach, data were collected from 489 respondents who had used e-learning, using a questionnaire distributed online. The results showed that Performance Expectancy, Effort Expectancy, and Learning Convenience had a significant influence on students' Behavioral Intention to use e-learning. Social Influence and Facilitating Conditions were proven to have no influence on Behavioral Intention. In addition, Educational Level acts as a moderating variable that strengthens the relationship between Learning Convenience and Behavioral Intention, with a stronger effect on postgraduate students. This study provides theoretical contributions by enriching the UTAUT study through the addition of new factors, as well as practical contributions for e-learning developers and educators in designing more effective and user-friendly platforms. These findings are expected to provide broader insights into the acceptance of e-learning across educational levels and geographic contexts.
Keywords: *UTAUT, E-learning, Student Intention, Learning Convenience*.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis faktor-faktor yang mempengaruhi niat mahasiswa untuk mengadopsi e-learning di Surabaya, dengan menggunakan model teori yang dimodifikasi dari Unified Theory of Acceptance and Use of Technology (UTAUT). Melalui pendekatan kuantitatif, data dikumpulkan dari 489 responden yang telah menggunakan e-learning, dengan menggunakan kuesioner yang disebarkan secara online. Hasil penelitian menunjukkan bahwa Ekspektasi Kinerja, Ekspektasi Usaha, dan Kenyamanan Belajar memiliki pengaruh yang signifikan terhadap Niat Perilaku siswa untuk menggunakan e-learning. Pengaruh Sosial dan Kondisi yang Memfasilitasi terbukti tidak memiliki pengaruh terhadap Niat Perilaku. Selain itu, Tingkat Pendidikan berperan sebagai variabel moderasi yang memperkuat hubungan antara Kenyamanan Belajar dan Niat Berperilaku, dengan pengaruh yang lebih kuat pada mahasiswa pascasarjana. Penelitian ini memberikan kontribusi teoritis dengan memperkaya studi UTAUT melalui penambahan faktor baru, serta kontribusi praktis bagi pengembang e-learning dan pendidik dalam merancang platform yang lebih efektif dan mudah digunakan. Temuan ini diharapkan dapat memberikan wawasan yang lebih luas tentang penerimaan e-learning di seluruh tingkat pendidikan dan konteks geografis.
Kata Kunci: UTAUT, E-learning, Niat Siswa, Kenyamanan Belajar.

INTRODUCTION

The world of education is undergoing major changes due to the COVID-19 pandemic. One of them is the implementation of PPKM, which requires online learning. Technology-based applications are used in the system to collect assignments and deliver items. Online learning has both advantages and disadvantages, and forces students and educators to adapt. Some students benefit from being able to keep attending classes despite working and not having to rent a boarding house. The government now allows face-to-face learning after two years of online education.

Although face-to-face learning has returned, the use of e-learning continues thanks to the various conveniences it offers. The delivery of materials and assignments through a Learning

Management System (LMS) facilitates more efficient interaction between lecturers and students. Research reveals that initial acceptance of an information system is important, but long-term continued use is also crucial (Ramadhan et al., 2022).

Online learning offers convenience and flexibility, while supporting self-learning initiatives among students. Moreover, e-learning encourages innovation and makes the lecture process more flexible, and in some cases, can increase student participation when compared to face-to-face methods (Dorthy and Sinaga, 2020; Sujiwo and A'yun, 2020). By utilizing technology, e-learning creates a more open, distributed, and accessible learning experience anytime and anywhere (Aurora and Efendi, 2019).There are several factors that influence students' intention to adopt e-learning. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a framework that has been widely used to evaluate user intention to adopt technology (Ermilinda et al., 2024).

Research on the UTAUT model shows that the framework can be applied to examine the behavioral intention of e-learning implementation (Abdou & Jasimuddin, 2020). Qiao et al. (2021) in their research found that the UTAUT model factors affect e-learning adoption. Yakubu & Dasuki (2019) used UTAUT in investigating the factors that influence the adoption and use of technology by university students. These results differ from the research of Ermilinda et al. (2024) which shows that performance expectancy, effort expectancy, social influence, and facilitating conditions cannot explain user intention to adopt e-learning. Lisana (2023) examined the factors that influence the intention to switch to e-learning using the Push Pull Mooring model. The results explain that learning convenience and perceived enjoyment are significant factors that influence the intention to use e-learning. This result is different from the research conducted by Farliana et al. (2023) that learning convenience and perceived enjoyment have no effect on the intention to use e-learning. Therefore, this study adds factors other than the UTAUT model, namely learning convenience and perceived enjoyment as factors that influence the intention to adopt e-learning. This study uses education level as moderation of UTAUT factors on behavioral intention. Research by Alrawi et al. (2020) examines the main factors of UTAUT that influence behavioral intention to adopt e-commerce using education level as moderation. Based on the background above, this research was conducted to examine the factors that influence students' intention to adopt e-learning by using the extended Unified Theory of Acceptance and Use of Technology.

METHOD

Sampling

This study aims to expand theoretical knowledge with practical implications, based on students' perceptions of the main factors that influence students' intention to use e-learning. This perception comes from students' experience in using e-learning at a certain time, which is measured by a questionnaire filled out by students themselves or a self-administered questionnaire. The distribution of questionnaires to respondents who are included in the target population category using google forms via email and Whatsapp and word of mouth using the snowball method from students who are targeted in their circle of friends.

The subjects in this research are students in Surabaya who have used e-learning. The minimum number of

respondents required using a 95 percent confidence level and a 5 percent precision level is 400 (Israel, 1992). With the use of online media, the data obtained were 542 respondents, of the total data, 53 respondents answered that they did not use e-learning. The remaining data is 489 respondents. Before the analysis process, the first step that must be done is data pre-processing, namely the data cleaning process to eliminate outliers. In this process leaves 417 data.

Measures

Measurement of each construct in this study uses statement items taken from previous research that have been tested valid and reliable. Performance Expectancy and Facilitating Conditions are measured using 3 and 4 items respectively based on references from Ermilinda's research (2024). Social Influence, Effort Expectancy and Behavioral Intention use 4 measurement items each taken from the reference Abbad (2021). Learning Convenience uses 3 measurement items based on references from Lisana's research (2023). And Perceived Enjoyment uses 3 measurement items taken from the reference Chen & Keng (2019).

The measurement items used in the questionnaire use a 5-point Likert scale to express the respondent's level of agreement with the statements submitted in the questionnaire. The scale is 1 for "strongly disagree", 2 for "disagree", 3 for "neutral", 4 for "agree" and 5 for "strongly agree".

RESULT AND DISCUSSION

The initial stage in the analysis process is descriptive statistics for respondent profiles using SPSS. This is done to find out a complete picture of the respondent's identity. The next stage is validity testing and data reliability testing using SPSS.

Descriptive Statistic

Table 1 shows the demographic characteristics of respondents. The data in the table shows 190 female respondents (45.6 percent) and 227 men (54.4 percent). Based on the description above, more respondents are male. The results of distributing questionnaires show that the age of respondents in this study is between 17 years and 59 years. The most respondents were respondents aged 20 years, where this age is the age of undergraduate student respondents. The most respondents came from the Economics and Business study program, totaling 270 or 64.7%. The Science and Technology study program ranks second with 99 respondents or 23.7%. The study program with the least number of respondents is General Medicine and Dentistry, which is 5 or 1.2%. The education level shows that undergraduate students totaled 311 respondents (74.6 percent) and postgraduate students totaled 106 respondents (25.4 percent).

Table 1. Respondents Profile

Demographic Characteristic		Frequency	Percent
Gender	Female	190	45,6
	Male	227	54,4
Age	17	5	1,2
	18	32	7,7
	19	59	14,1
	20	86	20,6

	21	78	18,7
	22	23	5,5
	23	22	5,3
	24	23	5,5
	25	8	1,9
	26	8	1,9
	27	10	2,4
	28	3	0,7
	29	4	1,0
	30	4	1,0
	31	3	0,7
	32	4	1,0
	33	4	1,0
	34	1	0,2
	35	5	1,2
	36	2	0,5
	37	4	1,0
	38	2	0,5
	39	4	1,0
	40	2	0,5
	41	1	0,2
	42	3	0,7
	44	1	0,2
	45	2	0,5
	46	1	0,2
	47	1	0,2
	48	1	0,2
	49	1	0,2
	50	2	0,5
	52	4	1,0
	53	1	0,2
	54	2	0,5
	59	1	0,2
Study Program	Economic and Bussiness	270	64,7
	Science and Technology	99	23,7
	Art and Design	9	2,2
	General and Dental Medicine	5	1,2
	Others	34	8,2
Educational Level	Undergraduate Students	311	74,6
	Postgraduate Students	106	25,4

Validity Test and Reliability Test

Table 2. Factor Analysis Stage 1

Indicator	Behavioral Intention	Perceived Enjoyement	Effort Expectancy	Facilitating Condition	Social Intelegence	Performance Expectancy	Learning Convenience
BI3		,816					

BI1	,805					
BI2	,788					
BI4	,666					
PJ3	,635					
PJ2	,605					
PJ1						
EE3		,803				
EE2		,760				
EE4		,690				
EE1		,660				
FC1			,681			
FC4			,656			
FC2			,654			
FC3			,509			
SI2				,793		
SI1				,768		
SI3				,712		
SI4				,515		
PE3					,782	
PE2					,753	
PE1					,572	
LC1						,774
LC2						,757
LC3						,704

Table 2 shows that the Perceived Enjoyment Indicator does not show the expected discriminant position even though it has met the convergence criteria. Because the Perceived Enjoyment value is lower than Behavioral Intention, the factor is removed from the analysis. After removing Perceived Enjoyment, the factor analysis process is repeated until all data is valid.

Table 3. Factor Analysis Stage 2

Indicator	Behavioral Intention	Effort Expectancy	Facilitating Condition	Social Intelegence	Performance Expectancy	Learning Convenience
BI3	,866					
BI1	,843					
BI2	,839					
BI4	,682					
EE3		,812				
EE2		,757				
EE4		,710				
EE1		,689				
FC1			,754			
FC4			,733			
FC2			,733			
FC3			,651			
SI2				,783		
SI1				,752		
SI3				,734		
SI4				,480		
PE3					,795	
PE2					,760	
PE1					,603	
LC1						,815
LC2						,810
LC3						,673

Table 3 above shows that each group of indicators in this study is able to show its position correctly. Each group of indicators can achieve two types of validity positions, namely discriminant and convergent.

The next test is the reliability test measured using Cronbach alpha. The

minimum Cronbach's Alpha value is 0.7 which indicates quite good consistency. The Cronbach's Alpha value data for each variable is presented in Table 4.4 below:

Table 4. Reliability Test

Latent Variable	Indicator	Alpha	Interpretation
Performance Expectancy	PE1, PE2, PE3	0,719	Acceptable
Social Influence	SI1, SI2	0,816	Good
Effort Expectancy	EE1, EE2, EE3, EE4	0,830	Good
Facilitating Conditions	FC1, FC2, FC4	0,829	Good
Learning Convenience	LC1, LC2	0,862	Good
Behavioral Intention	BI1, BI2, BI3	0,931	Very Good

The results of the analysis in Table 4 above show the Cronbach Alpha values of all variables that are good after removing several indicators. After the indicators used have successfully passed the validity and reliability test stages, the next step is the analysis process. The hypothesis test analysis process using AMOS can be seen in Figure 2.

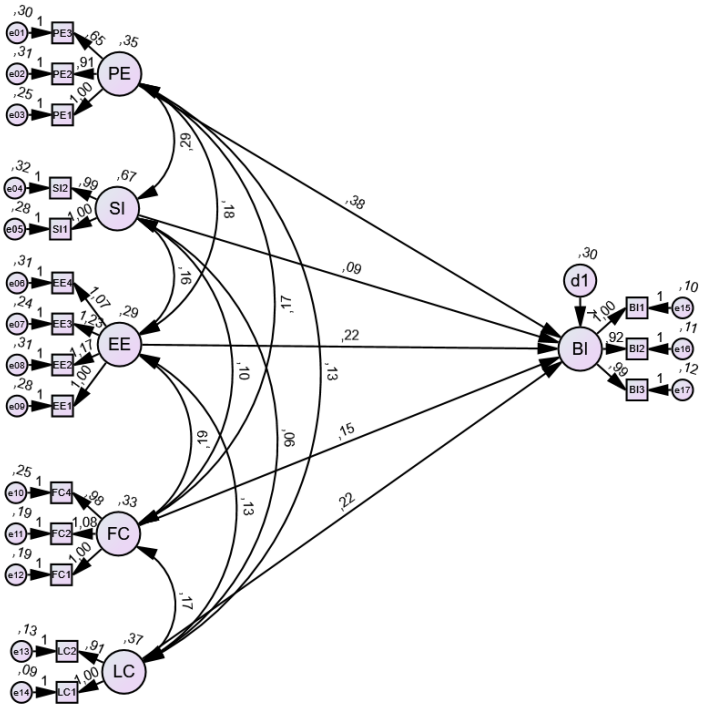

Figure 2. AMOS Analysis Model

Table 5. Hypothesis Test Results

Hypothesis	Estimate	S.E	C.R	P Label
PE → BI	0,381	0,110	3,474	***
SI → BI	0,091	0,060	1,515	0,130
EE → BI	0,222	0,094	2,350	0,019
FC → BI	0,149	0,090	1,652	0,099

LC → BI	0,225	0,065	3,460	***

Table 5 above shows the calculation of the analysis results made using AMOS software. There is an Estimation value that shows the unstandardized effect, which shows the effect or influence of the hypothesis being tested. The CR (Critical Ratio) value is used to determine whether the parameter being tested is significant or not. The CR is compared to the critical value of the normal distribution, which is usually 1.96 for a significance level of 5%. A parameter is considered statistically significant if the CR is more than 1.96 at a significance level of 5% ($p < 0.05$). If the CR is less than 1.96, then the parameter is not statistically significant. Based on the results of the analysis, it can be concluded that several factors have a significant influence on Behavioral Intention. Performance Expectancy is proven to have a positive and significant influence, with a highly significant P value (**) and a CR value of 3.474 (above 1.96), so the first hypothesis is accepted. In contrast, Social Influence does not show a significant influence, because the P value is not significant (0.13) and the CR value is 1.515 (below 1.96), so the second hypothesis is rejected. Furthermore, Effort Expectancy has a positive and significant influence on Behavioral Intention, as seen from the significant P value (*) of 0.019 and CR of 2.35 (above 1.96), so the third hypothesis is accepted. On the other hand, Facilitating Conditions does not have a significant influence, with a P value of 0.099 and CR of 1.652 (below 1.96), so the fourth hypothesis is rejected. Finally, Learning Convenience shows a positive and significant influence, with a very significant P value (**) and CR of 3.46 (above 1.96), so the fifth hypothesis is accepted. Thus, the factors Performance Expectancy, Effort Expectancy, and Learning Convenience have an important role in influencing Behavioral Intention, while Social Influence and Facilitating Conditions do not have a significant influence.

Table 6. Fit Statistic

N	CMIN/DF	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
417	2,298	0,028	0,937	0,908	0,938	0.964	0,964	0,056
Evalution criteria	< 3	→ 0	> 0,9	> 0,9	> 0,9	> 0,9	> 0,9	< 0,08

Fit statistic is an analysis tool intended to evaluate how well the empirical data that has been collected reflects or fits a previously designed theoretical model. Based on the results shown in Table 4.6, it can be concluded that the theoretical model used shows a fairly high level of fit.

Table 7. Moderation Test

Hypothesis	Effect	Comparison of Undergraduate and Postgraduate		
		Difference Standardize Estimate (S1 – S2)	Critical Diference Pairwise Parameter	Statistical Signal
H7a	PE → BI	-0,409	1,331	NS
H7b	SI → BI	0,43	-1,489	NS
H7c	EE → BI	0,143	-0,874	NS
H7d	FC → BI	0,058	-0,213	NS

H7e	LC → BI	-0,253	2,269	*

The results in Table 7 show that in the relationship between Performance Expectancy and Behavioral Intention there is no moderating effect, this is indicated by the insignificant pairwise value which below 1.96. So it can be concluded that the H7a hypothesis which states that Education level has a direct positive and significant influence on the direct effect from Performance Expectancy to Behavioral Intention cannot be accepted. This is in line with Alrawi's research (2020) which states that education level has no a moderating effect on the relationship between Performance Expectancy and Behavioral Intention.

In the relationship between Social Influence and Behavioral Intention, there is also no moderating effect, this is indicated by the insignificant pairwise value below 1.96. So it can be concluded that the H7b hypothesis which states that Education level has a direct positive and significant influence on the direct effect from Social Influence to Behavioral Intention cannot be accepted. This is in line with Alrawi's research (2020) which states that education level does not have a moderating effect on the relationship between Social Influence and Behavioral Intention.

This also occurs in the relationship between Effort Expectancy and Behavioral Intention. The pairwise value of both variables shows an insignificant value, which is below 1.96. So it can be concluded that the H7c hypothesis which states that Education level has a direct positive and significant influence on the direct effect of Effort Expectancy to Behavioral Intention cannot be accepted. This is in line with Alrawi's research (2020) which states that education level does not have a moderating effect on the relationship between Effort Expectancy and Behavioral Intention.

The moderation test result show that Facilitating Conditions and Behavioral Intention have no moderating effect, this is indicated by the insignificant pairwise value, which is below 1.96. So it can be concluded that the H7a hypothesis which states that Education level has a direct positive and significant influence on the direct effect of Performance Expectancy to Behavioral Intention cannot be accepted. This is in line with Alrawi's research (2020) which states that education level does not have a moderating effect on the relationship between Performance Expectancy and Behavioral Intention.

The pairwise value of the relationship between Learning Convenience and Behavioral Intention is 2.269 which indicates a significant value (*). This shows that Education Level has a moderating effect on the relationship between Learning Convenience and Behavioral Intention. So it can be concluded that H7e is accepted. The positive pairwise value indicates that the higher a person's education level, the greater the influence of Learning Convenience on Behavioral Intention. The negative Standardized Estimate difference value means that the relationship between Learning Convenience and Behavioral Intention is stronger at Education Level S2.

Discussion

Performance Expectancy is proven to have a positive and significant direct influence on Behavioral Intention, as the hypothesized in this study. This finding is supported by a significant p-value. The results of this study are in line with the study of Abdou & Jasimuddin (2020) which shows that Performance

Expectancy plays an important role in shaping behavioral intentions, especially when implementing technology. Similar results were also reported by Lai et al. (2024), which highlighted that high performance expectations drive individuals' willingness to use new systems. In addition, research by Abbad (2021) and Aziz et al. (2023) also supports the idea that performance expectancy can explain student behavior regarding the use of e-learning systems. A study by Jameel et al. (2022) strengthens this by showing that expectations of good performance are one of the most important predictors in determining behavioral intentions in using e-learning. This study is in contrast to the research of Ermilinda et al. (2024) and Hunde et al. (2023).

Based on the hypothesis proposed in this study, Effort Expectancy has a positive and significant direct effect on Behavioral Intention. This is evidenced by a significant p-value, which shows that the easier a technology is to use and understand, the more likely someone is to want to use it. The results of this study are consistent with the research of Abdou & Jasimuddin (2020) which highlights that the perception of ease of use of technology is an important factor influencing user behavioral intentions. Similar results were also found by Lai et al. (2024) showed that the ease of understanding and use of a technology contributes directly to user adoption decisions. Other studies such as Abbad (2021) and Aziz et al. (2023) also confirmed that the perceived ease of use plays an important role in increasing a person's interest in using a new system. In addition, Jameel et al. (2022) found that Effort Expectancy is an important factor in the formation of Behavioral Intention, especially when the technology is considered simple and easy. The results of this study contradict the research of Ermilinda et al. (2024).

Learning Convenience has been proved to have a positive and significant direct impact on Behavioral Intention. This is indicated by a significant p-value, indicating that the more convenient it is for someone to access and use learning materials, the more likely the individual is to has the intention to use the system or technology. This result is consistent with Lisana's research (2023) which states that convenience in the learning process such as flexible access and time efficiency contribute significantly to the formation of behavioral intentions. In other words, when users feel that the learning system is designed to support their needs without causing significant obstacles, they will be more interested in using the learning system. This result is contradicts the result of research by Farliana et al. (2023).

The results of the study showed that there were two rejected hypotheses, namely H2 and H4. Social Influence does not have a positive and significant direct influence on Behavioral Intention. This is evidenced by the p value above 0.05. The results of this study are in line with several previous studies. Ermilinda et al. (2024) found that Social Influence is often not the main factor that shapes behavioral intentions, especially when individuals prioritize intrinsic factors. Hunde et al. (2023) highlighted that Social Influence has no direct effect on Behavioral Intention. The same results were also conveyed by Jameel et al. (2022), Abbad (2021) and Lai et al. (2024). Overall, these results are consistent with previous studies showing that Social Influence is not always the main factor influencing Behavioral Intention. This is because students usually have strong intrinsic motivation to use e-learning, such as the need to achieve academic goals or improve

understanding. This motivation may be more influenced by perceived benefits and convenience than by social influences such as friends, instructors, or the environment. Students are often trained to be independent learners. In this context, the decision to use e-learning may be made based on individual needs and personal learning strategies, making social influences less important.

Facilitating Conditions does not have a positive and significant direct influence on Behavioral Intention. This is evidenced by the p value above 0.05. The results of this study are in line with the research of Ermilinda et al. (2024) which shows that the existence of supporting facilities and resources such as access to technology alone is not enough to facilitate a person's intention to use technology. This may occur because individuals, including students, tend to be more influenced by the perceived usefulness and ease of use of supporting facilities than their availability. Furthermore, if individuals feel that they can use technology independently or have sufficient knowledge, then the existence of Facilitating Conditions that influence their intentions becomes less important.

In the moderation test, it was found that only the H7e hypothesis was accepted. This shows that Education Level has a strong moderating effect on the relationship between Learning Convenience and Behavioral Intention. The Standardized Estimate value for the postgraduate group is 0.417, which is greater than the undergraduate group, which is 0.148. This means that the relationship between Learning Convenience and Behavioral Intention is stronger at Education Level postgraduate.

Theoritical Contributions

This study provides theoretical implications for the widespread adoption of literature by testing the theoretical validity and empirical application of the UTAUT model in examining factors that influence students' intention to adopt e-learning. This study extends the UTAUT theory as a basic framework to propose a modified theoretical model by including push factors (Learning Convenience) and pull factors (Perceived Enjoyment) in the use of e-learning and highlights their important roles in adopting e-learning. This provides a theoretical contribution to enrich the UTAUT studies by adding factors that push and pull users to adopt e-learning. This variable has previously been included as a factor in the PPM (Push Pull Mooring Effect) theory that influences users' intention to use e-learning but has not been widely included in empirical research on UTAUT. The results of this study validate and confirm that Learning Convenience is an important factor to consider in research on e-learning adoption, because Learning Convenience has been shown to influence students' intention to adopt e-learning. Other results show that Performance Expectancy and Effort Expectancy have a significant influence on students' Behavioral Intention in adopting e-learning.

This study examines the impact of the Educational Level moderator on the relationship between factors influencing Behavioral Intention. The results of this study indicate that Educational Level plays an important role in the relationship between Learning Convenience and Behavioral Intention of students to adopt e-learning. The moderating effect is stronger in postgraduate students. This study replicates the results of previous research, namely Alrawi (2020), which tested Educational Level on the relationship between the four main factors of UTAUT (Performance Expectancy,

Social Influence, Effort Expectancy, Facilitating Conditions) and Behavioral Intention. However, there has been no study that has tested the moderating effect of Educational Level on the relationship between Learning Convenience and Behavioral Intention.

Practical Contributions

This study also provides practical contributions to developers, educators, and educational institutions. Firstly, by identifying key factors that influence student intentions, this study can help e-learning developers design platforms that are more user-friendly, efficient, and tailored to student needs. Improve user-friendly interfaces or provide more quality and relevant content. Secondly, the results of this study can be a guide for educators to effectively integrate technology into their learning methods, such as through the use of interactive media and collaborative features that can increase student engagement. Thirdly, this study provides strategic insights for educational institutions to optimize the delivery of e-learning by increasing the benefits of e-learning platforms, the ease of use of the platform, and the convenience of adopting technology.

CONCLUSION

This study examines the importance of Performance Expectancy, Social Influence, Effort Expectancy, Facilitating Conditions, Learning Convenience and Perceived Enjoyment in predicting students' intention to adopt e-learning. This study aims to identify factors that influence students' intention to adopt e-learning. The UTAUT model is used as a basic framework in testing by adding Learning Convenience and Perceived Enjoyment variables. This study also examines Educational Level as a moderator in the relationship between these factors and Behavioral Intention.

The results of this study found that Performance Expectancy and Learning Convenience are strong factors in influencing students' Behavioral Intention in adopting e-learning. Although it has a smaller impact, Effort Expectancy is proven to have a positive and significant direct influence on Behavioral Intention. The Perceived Enjoyment variable was removed from the model because it was proven to be non-discriminant during the validity test. Other results showed that Social Influence and Facilitating Conditions are proven to have no influence on Behavioral Intention. This indicates that students' decisions to use e-learning are not influenced by social factors or external conditions such as infrastructure.

Furthermore, this study found that Education Level moderates the relationship between Learning Convenience and Behavioral Intention. This result is stronger at the level of education of postgraduate students. This indicates that postgraduate students are more comfortable with e-learning, thus increasing their desire to use it. However, Educational Level does not moderate the relationship between the other four factors, namely Performance Expectancy, Social Influence, Effort Expectancy and Facilitating Conditions, on Behavioral Intention. It can be interpreted that the level of education does not affect the extent to which these factors influence students' intention to adopt e-learning at both undergraduate and postgraduate levels.

This study has several limitations. First, data collection in this study was only conducted at several large universities in the city, where the facilities and comfort of the universities must be very good. The results may be different if the study was conducted at

universities in the regions. Secondly, this study investigates the impact of moderating factors only on the education level of undergraduate and postgraduate students. In general, students at the undergraduate and postgraduate levels tend to have better abilities to adapt to the use of technology and online-based learning methods. However, this may be different when applied to other education level. Thirdly, this study only uses Educational Level as a moderating variable. The moderating effect will be different when using other individual factors, such as gender.

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